

In the Claims:

1. (Currently Amended) A method for manufacturing a thin film transistor comprising the steps of:

depositing a non-single crystal semiconductor film on an insulting substrate;

introducing at least one dopant into whole of said non-single crystal semiconductor film;

irradiating said non-single crystal semiconductor film with a laser beam to convert a non-single crystal material of said non-single crystal semiconductor film into a single crystal material, resulting in formation of a crystallized semiconductor film; and

forming transistors of different conductivity types in said crystallized semiconductor film,

said method being further constructed such that a ratio between quasi-fermi level of said single crystal material corresponding to one of said transistors of different conductivity types and quasi-fermi level of said single crystal material corresponding to the other of said transistors of different conductivity types is between 0.5 : 1 and 2.0 : 1

wherein introducing at least one dopant into whole of said non-single crystal semiconductor film includes introducing said at least one dopant into whole of said non-single crystal semiconductor film through a protective film formed on said non-single crystal semiconductor film and wherein irradiating said non-single crystal semiconductor film with a laser beam includes removing said protective film from said non-single crystal semiconductor film and then irradiating said non-single crystal semiconductor film with said laser beam.

2. (Original) The method for manufacturing a thin film transistor according to claim 1, wherein introducing at least one dopant into whole of said non-single crystal semiconductor film includes introducing dopant atoms of one conductivity type into said non-single crystal semiconductor film corresponding to one of said transistors of different conductivity types, and subsequently, introducing dopant atoms of the other conductivity type into said non-single crystal semiconductor film corresponding to the other of said transistors of different conductivity types.

3. (Original) The method for manufacturing a thin film transistor according to claim 1, wherein introducing at least one dopant into whole of said non-single crystal semiconductor film includes introducing dopant atoms of any one of two conductivity types into whole of said non-single crystal semiconductor film.

4. (Cancelled)

5. (Original) The method for manufacturing a thin film transistor according to claim 1, further comprising the step of subjecting said crystallized semiconductor film to plasma processing and heat processing with temperatures in the range of 290 to 340 degrees C. between the step of crystallizing said non-single crystal semiconductor film to form a crystallized semiconductor non-single crystal semiconductor film and the step of forming transistors of different conductivity types in said crystallized semiconductor film.

6. (Original) The method for manufacturing a thin film transistor according to claim 5, wherein said heat processing is carried out in an inactive gas atmosphere.

7. (New) A method for manufacturing a thin film transistor comprising the steps of:
depositing a non-single crystal semiconductor film on an insulting substrate;
introducing at least one dopant into whole of said non-single crystal semiconductor film;

irradiating said non-single crystal semiconductor film with a laser beam to convert a non-single crystal material of said non-single crystal semiconductor film into a single crystal material, resulting in formation of a crystallized semiconductor film; and

forming transistors of different conductivity types in said crystallized semiconductor film, and

wherein introducing at least one dopant into whole of said non-single crystal semiconductor film includes introducing said at least one dopant into whole of said non-single crystal semiconductor film through a protective film formed on said non-single crystal semiconductor film and wherein irradiating said non-single crystal semiconductor film with a

laser beam includes removing said protective film from said non-single crystal semiconductor film and then irradiating said non-single crystal semiconductor film with said laser beam.

8. (New) The method for manufacturing a thin film transistor according to claim 7, wherein introducing at least one dopant into whole of said non-single crystal semiconductor film includes introducing dopant atoms of one conductivity type into said non-single crystal semiconductor film corresponding to one of said transistors of different conductivity types, and subsequently, introducing dopant atoms of the other conductivity type into said non-single crystal semiconductor film corresponding to the other of said transistors of different conductivity types.

9. (New) The method for manufacturing a thin film transistor according to claim 7, wherein introducing at least one dopant into whole of said non-single crystal semiconductor film includes introducing dopant atoms of any one of two conductivity types into whole of said non-single crystal semiconductor film.

10. (New) The method for manufacturing a thin film transistor according to claim 7, further comprising the step of subjecting said crystallized semiconductor film to plasma processing and heat processing with temperatures in the range of 290 to 340 degrees C. between the step of crystallizing said non-single crystal semiconductor film to form a crystallized semiconductor non-single crystal semiconductor film and the step of forming transistors of different conductivity types in said crystallized semiconductor film.

11. (New) The method for manufacturing a thin film transistor according to claim 10, wherein said heat processing is carried out in an inactive gas atmosphere.

12. (New) A method for manufacturing a thin film transistor comprising, in order, the steps of:

depositing a non-single crystal semiconductor film on an insulting substrate;

introducing a first dopant, of a first conductivity type, into substantially the whole of said non-single crystal semiconductor film, said first dopant being introduced through a protective film formed on said non-single crystal semiconductor film;

masking a surface of said non-single crystal semiconductor film to delineate first and second type transistor regions to be formed on said non-single crystal semiconductor film;

introducing a second dopant, of opposite conductivity type to said first dopant, into said non-single crystal semiconductor film, said second dopant being introduced in regions of said non-single crystal semiconductor film that are exposed by openings in said mask;

removing said mask and said protective film; and

irradiating said non-single crystal semiconductor film with a laser beam to convert a non-single crystal material of said non-single crystal semiconductor film into a single crystal material, resulting in formation of a crystallized semiconductor film; and

forming transistors of first and second conductivity types in said crystallized semiconductor film.

13. (New) The method for manufacturing a thin film transistor according to claim 12, wherein:

a ratio between quasi-fermi level of said single crystal material corresponding to one of said transistors of different conductivity types and quasi-fermi level of said single crystal material corresponding to the other of said transistors of different conductivity types is between 0.5 : 1 and 2.0 : 1

14. (New) A method for manufacturing a thin film transistor comprising, in order, the steps of:

depositing a non-single crystal semiconductor film on an insulting substrate;

introducing a first dopant, of a first conductivity type, into substantially the whole of said non-single crystal semiconductor film;

masking a surface of said non-single crystal semiconductor film to delineate first and second type transistor regions to be formed on said non-single crystal semiconductor film;

introducing a second dopant, of opposite conductivity type to said first dopant, into said non-single crystal semiconductor film, said second dopant being introduced in regions of said non-single crystal semiconductor film that are exposed by openings in said mask;
removing said mask; and
irradiating said non-single crystal semiconductor film with a laser beam to convert a non-single crystal material of said non-single crystal semiconductor film into a single crystal material, resulting in formation of a crystallized semiconductor film; and
forming transistors of first and second conductivity types in said crystallized semiconductor film.

15. (New) The method as recited in claim 14 wherein a ratio between quasi-fermi level of said single crystal material corresponding to one of said transistors of different conductivity types and quasi-fermi level of said single crystal material corresponding to the other of said transistors of different conductivity types is between 0.5 : 1 and 2.0 : 1

16. (New) A method for manufacturing a thin film transistor comprising, in order, the steps of:

depositing a non-single crystal semiconductor film on an insulting substrate;
depositing a protective film on said non-single crystal semiconductor film;
introducing a first dopant, of a first conductivity type, into substantially the whole of said non-single crystal semiconductor film, said first dopant being introduced through said protective film formed on said non-single crystal semiconductor film;
removing said protective film;
irradiating said non-single crystal semiconductor film with a laser beam to convert a non-single crystal material of said non-single crystal semiconductor film into a single crystal material, resulting in formation of a crystallized semiconductor film; and
masking a surface of said non-single crystal semiconductor film to delineate first and second type transistor regions to be formed on said non-single crystal semiconductor film;
introducing a second dopant, of opposite conductivity type to said first dopant, into said non-single crystal semiconductor film, said second dopant being introduced in regions of said non-single crystal semiconductor film that are exposed by openings in said mask;

forming transistors of first and second conductivity types in said crystallized semiconductor film.

17. (New) The method as recited in claim 16 further comprising the step of: prior to said masking step, forming a gate oxide film on said crystallized semiconductor film.

18. (New) The method as recited in claim 16 wherein a ratio between quasi-fermi level of said single crystal material corresponding to one of said transistors of different conductivity types and quasi-fermi level of said single crystal material corresponding to the other of said transistors of different conductivity types is between 0.5 : 1 and 2.0 : 1